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Industrial Design Innovation of Sarawak Contemporary Furniture Design

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Abstract

This paper is part of a fundamental research on indigenous Dayak's motif of Sarawak as part of innovative design element for a contemporary chair design. Reviews of existing study on relation between novel, augmented, and copied designis used as a basis for establishing a distinctive Sarawak image in the Malaysian furniture industry through the approach of methodology of industrial design. The research opportunities are focus on a number of significant disparities that have restricted the development of competitive furniture designs from Sarawak in particular. These disparities include the manufacturers' unfamiliarity with innovative design approach, a lack of understanding on the importance of good design, uncertainty on user needs, and inappropriate use of critical design elements. The introduction of pioneered material species; despite providing new alternative to materials, adds further disparities to new furniture design and development as more resources will need to be allocated for design management, development, testing and validation. This article provides an academic perspective on the contribution of industrial design to both innovation and performance. This perspective can be referred and adapted by the furniture industry player in Sarawak to establish a formal furniture design framework that emphasis industrial design, which could enable them to compete in the local and international market.

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1. Introduction

The furniture industry is one of the most prosperous industries in Malaysia. In fact, Malaysia stands among the world's top ten wooden furniture producer with 2% share of the global furniture market or Ringgit Malaysia 4 billion of the total Malaysia export earnings from export of timber products in 2010(1).The Malaysian Industrial Development Authority (MIDA) earlier in 2011 revealed that it has approved major furniture projects that created employment for about 5,000 people (2).

Now, Malaysia is stepping further into being recognised as furniture design destination (3). The country has the potential to provide creative and innovative international high fashion furniture design based on local design elements. However, these elements have not being explored and exploited to create a truly Malaysian image. Europe is famous for the “Italian style” luxury furniture and Indonesia is well-known for the exclusive teak furniture, which has proved to be highly in demand with the affluence users throughout the country. The furniture manufacturers in Malaysia should adopt the European and the Indonesian approach in establishing its own furniture image. One distinct indigenous design element that could be applied to the furniture design in Malaysia is the indigenous Dayak’s Motifs (Refer to Figure 1). These motifs are well recognised in Malaysia and could well be adopted as one of the prominent image of Malaysian furniture.



Fig. 1. The indigenous Dayak Iban motif is a representation of one of Sarawak’s unique culture that could be adapted as furniture design element (Image source: flickr.com, 2010).

The Sarawak pottery famed as ‘Pasu Sarawak’ to local and international tourist cannot be replicated by the furniture industry as there is currently no distinction in the furniture design that depicts an authentic Sarawak image. The indigenous Dayak’s motifs, albeit being eminent in Malaysia are only applied in custom made furniture for specific users (Refer to Figure 2). This approach has confined the furniture locally and did not help in proclaiming the design at international level. Apart from the custom made furniture, there has been very minimal authentic local design for furniture as majority of the furniture design in Malaysia are copies of existing renowned and established design from Europe. Therefore, there is a need for optimisation of local elements in the design of Malaysian furniture but perhaps the main question that should be ask before embarking with the project is *howshall it be done?*. There are several ways to design furniture but due to the stiff competition in the market, one has to find a methodology that would allow the design to compete and be profitable in both the local and international market. Industrial design is one of the methodologies that have proven to play an increasingly significant role in enhancing the quality of products by emphasising aesthetics appeal and innovative utilities.



Fig. 2. The Hilton Longhouse Hotel lounge furniture in Sarawak is an example of custom furniture design that depicts the indigenous Dayak Iban motif (Image source: Abdullah, 2012).

2. Innovation opportunity

To be competitive in the current market environment, furniture manufacturers have to adopt an innovative strategy that will give them the competitive edge not only in the aspects of technology but also aesthetics and utilities. Apart from the increase cost in material and transportation, the lack of styling creativity in the design has put a disadvantage on the furniture to compete especially in the export market. New ideas and method are needed by the enterprise to improve their product values. These values can be determined through understanding of user needs whether they are physical needs or psychological needs. A research conducted on the psychological needs of consumers revealed that more consumers are willing to pay a higher price for higher level of satisfactions (4). However, in the midst of the rising cost of production and transportation, most manufacturers are unwilling to invest in new technology. This has put industrial design as the best cost effective alternative in innovating every aspect of product design and development, manufacturing, and marketing.

Industrial design is not a new product development methodology but it is practically unfamiliar with most manufacturers in Sarawak. There is a close relationship between industrial design and the needs of consumers whereby in the process of industrial design, the needs of the customer's played a decisive role. Most furniture manufacturers in Malaysia tend to reproduce new furniture based on existing design with modifications of some features to avoid exact replication of the design. The process of reproducing designs in this way does not contribute to new innovation and basically deprived the consumer's psychological needs. In the recent *Sarawak Furniture Industry Entrepreneurs Development Seminar 2012* organised by the *Forest Research Institute of Malaysia (FRIM)* and *Universiti Malaysia Sarawak*, most of the participating manufacturers and suppliers are not familiar with the industrial design terminology, far more from practicing the methodology in their design and development process. In fact the participating organisations and suppliers are only introduced to the methodology by one of the seminar's presenter.

The furniture design fundamentals are already well established particularly in the aspects of structural configuration, materials, ergonomics, and functionalities. These fundamentals are so established that the only way to make differentiations on the design is through its appearance, and appearance is closely associated with aesthetics. The aesthetics appeal of a furniture product is the first factor that attracts consumers. Consumers will be interested in the furniture if the design appeals to their personal preference. However it will be a difficult task for manufacturers to meet all personal preference, thus the best approach is to embark on creating and establishing a universal image. Similar to a corporate identity, a product image must portray several significant aspects such as the products originality, quality, durability, and recognition. Among those aspects, to get recognition for furniture to represent the image of a state or country needs meticulous consideration. Since the indigenous Dayak's motif design is highly recognised among Malaysians and tourists as the image of Sarawak, it is possible to incorporate these motifs in the furniture design and adopt them as the identity of Sarawak furniture.

Sarawak's Dayak's indigenous motifs designs are beautiful and mythical (5). They have the greatest potential to be incorporated in contemporary furniture design. The unique designs are however very delicate and may need comprehensive research in order for the design to be successfully integrated into the total design of the furniture. If the indigenous motifs are to be combined, special consideration need to be given to the creation of the combined pattern design in order to prevent discontentment of the indigenous groups over the claim of the furniture's name. Sustainability of the design, creative innovation and use of quality materials should be emphasis in the development to establish the new design as well as providing some advantages over its competitors, both in the local and international markets. Design research should also be conducted on stylising the design to meet international market trends. The output of the research will be contemporary furniture inspired by Dayak's indigenous motifs.

3. Industrial design methodology

The main purpose of industrial design is to meet the needs of the users through critical visual and tangible elements within the design (6). The influence of industrial design is unrestricted as industrial design services can be applied in most industries (7). The process of industrial design has been described as phases of activities that are primarily user-driven rather than technology driven (8;9). This implies that industrial design process relates mainly to aspects between user and the product rather than the relations internal to the product. Therefore activities that relate to the technical aspects of the product do not fall under industrial design. Instead, these activities are generally engineering related.



Fig. 3. Generic industrial design process (Adopted from: Ulrich &Eppinger, 2000).

Generically, the process of industrial design involves six stages that begin with 1) Investigation of user needs. 2) Conceptualisation of design. 3) Preliminary refinement of a design. 4) Final concept selection of a design. 5) Production of control drawings. 6) Coordination with cross-functional project members (Refer to Figure 4). For each stage of the process, emphasis is given to achieve the final goals of satisfying both the manufacturer and consumer needs by continuously considering the industrial design critical measures (Refer to Table 1) (10).

Table 1 – Industrial design critical measures and objectives.

	Industrial Design Critical Measures	Outcome Objective
I	Usability (Utilities)	Ease of use; ease of maintenance; quality and quantity of interaction; safety; novelty of interaction; ergonomics
II.	Aesthetics	Product differentiation; pride of ownership, image and fashion; communication.
III.	Costs	Cost benefits and trade-offs; appropriate usage of resources.
IV.	Production	Manufacture and assembly; appropriate usage of raw materials; tooling; packaging.
V.	Product life-cycle	Life-cycle design; material selection

The industrial design critical measures are the key aspects that must be considered by the furniture manufactures in producing competitive furniture products. In the aspect of usability, the furniture must enable ease of use as well as maintenance. The quality of interaction between the user and the furniture must be optimised while the quantity of negative interaction should be minimised. The safety aspects of the furniture must conformed to the international standards, which generally emphasised on the safety of material used, structural rigidity, and ergonomics. To enable the furniture to securely compete in the market, the design should revealed features of differentiators which made the design different from what are already in the market. The unique and stylist design of the furniture could instil the pride of ownership, image and style. The first impression of potential customers towards the furniture is inspired by the appearance of the furniture therefore the design of the furniture must be aesthetically appealing in order to attract the attention of potential buyers.

Many manufacturers today are looking for cost effective ways to compete in the market. The stiff competition in the market today leads to the need of very quick product change. Industrial design provides a cost effective and innovative ways to meet the quick demand through redesigning of enhance features without effecting the technology and workability of the product. Industrial design may also be involve in the manufacturing stage of furniture production by assisting in the configuration design of assembly area that optimised ergonomics in the work areas. Industrial design can be utilised on materials selections for furniture thus facilitating environmental friendly disposal of old furnitures.

4. Project Overview

This section describes an overview of a furniture project that utilised the industrial design methodology in the design and development process. The work is part of a final year student project on the adaptation of indigenous DayakIban motifs on contemporary furniture design.

Design

In Sarawak, the most notable indigenous motif is the Iban carving and the 'puakumbu' woven textile (Refer to Figure 4). Puakumbu was chosen as the subject that will be adapted as one of the design element in the furniture design. As mentioned in the Sarawak Museum Journal, puakumbuis an exotic textile, often referred to as a blanket but more appropriately simply called a cloth. There are numerous uses of puakumbu which has great significance in the traditional life of the Iban communities. Sometimes puakumbu is referred to as the sacred blanket as it is also used in farming rituals and other ceremonies.

The execution of the design process begins with identification of the suitable motif that is to be adapted. The puakumbu motif design is the most suitable as it is symmetrical and publicly well known. The symmetrical design of puakumbu also distinct it from the indigenous design of other communities in Sarawak. Several interviews and surveys were conducted with users and experts in the field and inputs data from the investigations were used to create the initial concept of the new furniture. Several development of conceptual design ideas were generated based on the data (Refer to Figure 5). A conceptual design of a stylised puakumbu however must not deviate from its original essence. A final design idea is selected based on acceptable rationales and justifications. A validation exercise is also conducted on the design by potential consumers and experts.



Fig. 4. A traditional 'PuaKumbu' design that is adapted as a design element to portray the image of Sarawak furniture (Image source: Sharifah, 2012).

Once the final design is selected, the process proceeds to refinement of the design to further enhanced the features to the overall furniture design. Basically, the pattern design of puakumbu is stylised and modernised without affecting intrinsic values of the pattern. The final pattern design is then applied on the furniture design which is developed concurrently with the pattern design. Industrial design methodology is applied in the design and development process of the occasional furniture (Refer to Figure 6, 7 and 8).

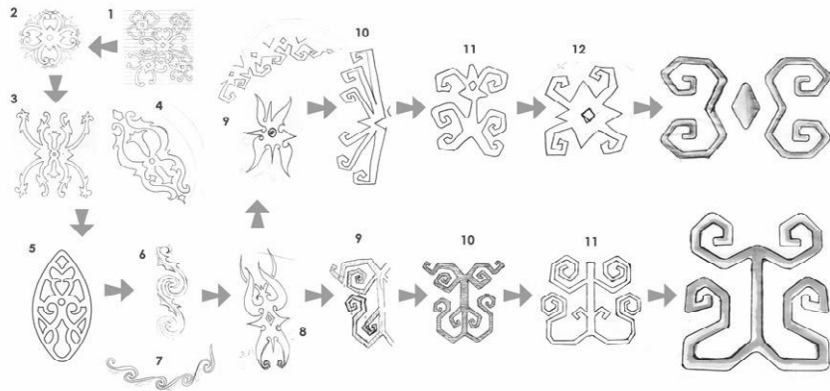


Fig. 5. Development sketches of Iban motif (Image source: Sharifah, 2012).

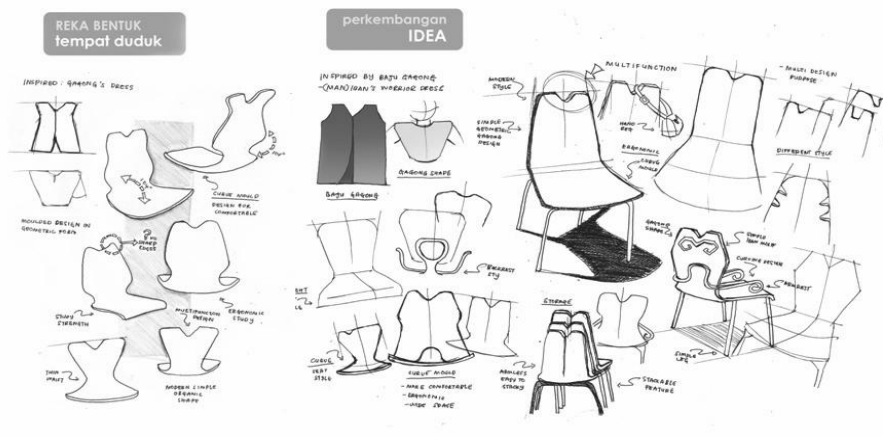


Fig. 6. Idea development sketches of occasional chair inspired by Iban attire and indigenous

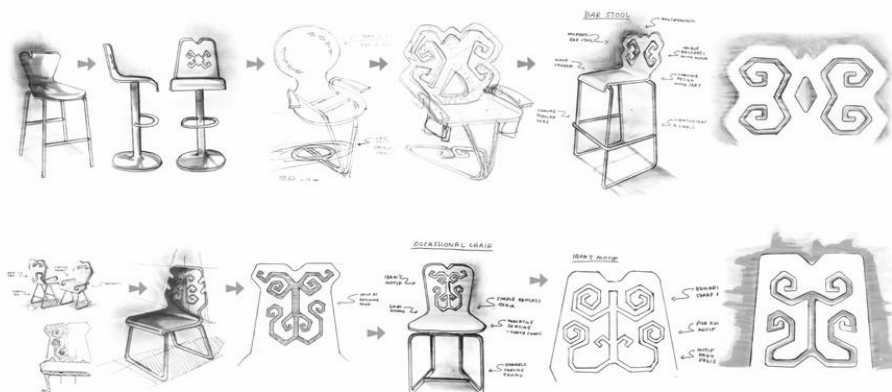


Fig. 7. chair integrated

5. Production

The material selection used to manufacture the chair is laminated moulded veneer. This material was selected based on several factors which include its low cost, durability, easy of assembly, and most importantly the uncomplicated process to machining (carve) out the motif on the material's surface. The machining of the motif is done through computer numerical control (CNC) process (Refer to Figure 9) to facilitate speedy and high quality output. The use of CNC process also minimised the finishing process. After the chair has been machined for the motif, it is then transferred to the final finishing section for sanding and buffing process. The buffed chair is then sent for painting or finishing lacquer. The final touch of the chair is fixing of the legs. The following are images (Refer to figure 9, 10 and 11) show parts of the manufacturing processes. All figures should be center aligned. The figure number and caption should be typed below the figures in 8 pt, left justified, with subsequent lines indented.

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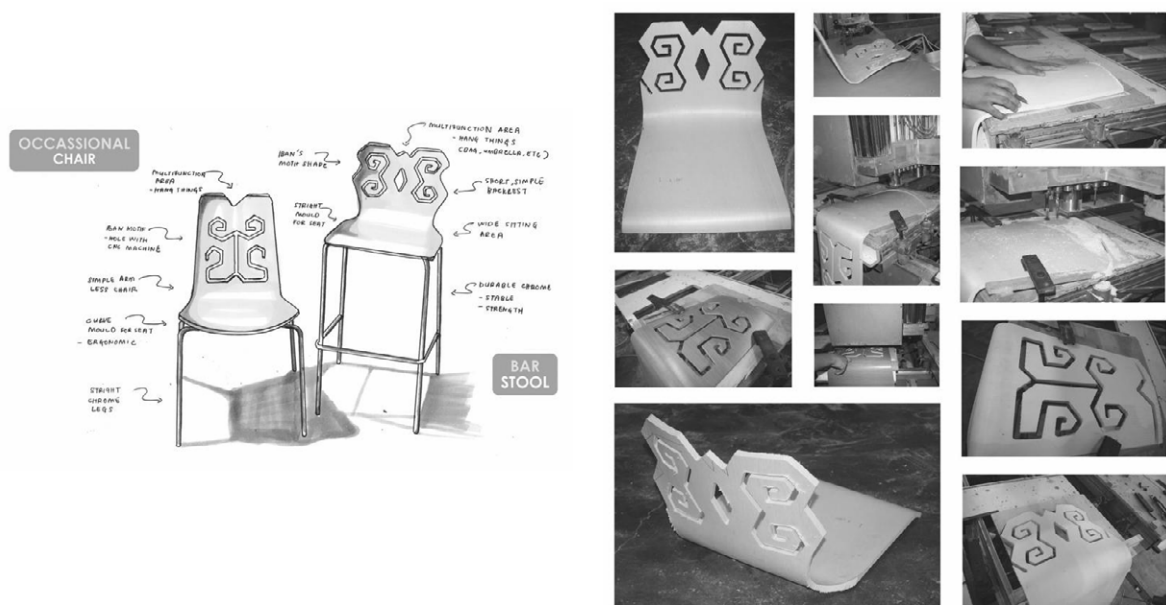


Fig. 8. Final design of contemporary occasional chair incorporating indigenous design motif that portrays the image of Sarawak (Image source: Sharifah, 2012).



Fig. 9. Sanding of laminated chair body (Image source: Sharifah, 2012)



Fig. 10. The finishing touch of machined chair body (Image source: Sharifah, 2012).



Fig. 11. Lacquering process of the laminated chair body (Image source: Sharifah, 2012)

6. Summary

The application of Dayak indigenous motifs are mainly on handicrafts and cottage industries products. In comparison to the so called “Italian style furniture” with flower motifs, as well as the locally famous teak exclusive furniture, there are very limited furniture designed with integrated Dayak motifs in the local and international market. The application and exploitation of the Dayak motifs on furniture design is virtually non-existence in the local furniture industry. With the integration of the motifs and modern asymmetrical design, a new image of contemporary wooden furniture may be created through the process of industrial design (Refer to Figure 12 and 13). The inclusion of this design in future furniture market could create a significant increase in Malaysian companies’ shares of the market compare with the current 2% shares.



Fig. 12 Uses of the bar stool as aesthetic element in interior design
(Image source: Sharifah, 2012).



Fig. 13. – The new integrated indigenous motif create a sense of modern ethnicity in amodern office environment (Image source: Sharifah, 2012).

The application of stylised motif designs, improved manufacturing techniques, used of suitable and durable traditional materials of wood and fabric will be emphasize to ensure the sustainability of the selected motifs and culture. The introduction of this new height of furniture design into the local and international furniture market will not only provide exclusivity to the motifs but also prominently promote the modernised Dayak's ethnic culture internationally.

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